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ABSTRACT

Graduate programs in Educational Administration use a variety of screening strategies, including the Graduate Records Examination (GRE) when selecting and admitting students. In order to earn Standard Principal Certification in Texas, an Educational Administration candidate, in addition to completing a graduate program, must also pass the Standard Principal Examination for the Certification of Teachers in Texas (ExCET). This study examined the correlation between a students GRE score and the students ExCET score. Scores of 30 students from 1 university and 23 from another were used. The data clearly demonstrate a correlation between the GRE and ExCET scores. A scatterplot was derived to show this correlation, and a least square regression line was used to derive a linear equation for predicting Standard Principal ExCET score using the GRE score. (SLD)

Running head: THE RELATIONSHIP BETWEEN GRE SCORES AND PERFORM

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The Relationship Between GRE Scores and Performance
on the

Standard Principal Examination for Certification of Educators in Texas (ExCET)

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ABSTRACT

Graduate programs in Educational Administration use a variety of screening strategies, including the Graduate Records Examination (GRE), when selecting and admitting students. In order to earn Standard Principal Certification in Texas, a Educational Administration candidate, in addition to completing a graduate program, must also pass the Standard Principal Examination for the Certification of Teachers in Texas (ExCET). This study examined the correlation between an Educational Administration student's GRE score as a predictor of that students ExCET score.

The data clearly demonstrates a correlation between the Graduate Records Examination (GRE) and the Standard Principal Examination for the Certification of Teachers in Texas (ExCET). Having identified this correlation, using a scatterplot, the study also utilized a least squares regression line in order to derive a linear equation for predicting Standard Principal ExCET score using GRE scores.

The Relationship Between GRE Scores and Performance
on the
Standard Principal Examination for Certification of Educators in Texas (ExCET)

Educational Research Service (1998) has estimated that within the next ten years 50 percent of all public school administrators will retire. According to their report, *Is There a Shortage of Qualified Candidates for Openings in the Principalship*, 47 percent of urban districts, 45 percent of suburban districts, and 52 percent of rural districts reported shortages of qualified candidates for principal vacancies. Who will fill this void? Will there be a sufficient quantity of qualified individuals to meet the demand?

The certifying of professional administrators is a state decision. In the past the completion of a sequence of courses and submitting the appropriate application to a state agency charged with certifying administrators has been the requirement for certification as an administrator. However, as States have moved toward a performance based accountability model more and more states have instituted a examination as a part of the initial certification process.

The Problem: GRE as a Predictor of Success on Standard Principal ExCET

Historically one of the factors used to determine admittance to graduate schools is the Graduate Record Examination (GRE). However, is GRE performance a good predictor of success on the Standard Principal ExCET? The State of Texas uses a

performance based accountability model at all levels of its educational system. Since 1981, one of the cornerstones of the system is the Examination for Certification of Educators in Texas (ExCET). Prior to receiving a certification in Texas, a candidate must secure a satisfactory score on the ExCET as established by the State Board for Educator Certification (SBEC). SBEC is the entity legislatively charged with overseeing all certification of educators in the State of Texas. The philosophy implied in the system is that certification assessments help to ensure that successful candidates possess the proficiencies necessary for success in the particular position.

Certification - Standard Principal

Chapter 241 of the Texas Administrative Code (2001) establishes the requirements for a Standard Principal certification, which is required for an administrative position as an assistant principal or principal in a Texas public school. Effective September 1, 2000, prior to admission to an administrator preparation program, an individual must: 1) hold a baccalaureate degree from an accredited institution of higher education, 2) demonstrate an acceptable combination of a score on a nationally-normed assessment and grade point average determined by the preparation program.

Standard Principal - ExCET

Principal certification in Texas requires the certification candidate to earn a passing score on the Standard Principal ExCET (Number 68). The Standard Principal

ExCET content is derived from and tests knowledge, skills and abilities in nine competencies clustered around three domains. They are as follows:

Domain I – School Community Leadership

Competency 001

The principal knows how to shape campus culture by facilitating the development, articulation, implementation, and stewardship of a vision of that is shared and supported by the school community (State Board for Educator Certification, 2000, p. 4).

Competency 002

The principal knows how to communicate and collaborate with all members of the community, respond to diverse interests and needs, and mobilize resources to promote student success (p. 7).

Competency 003

The principal knows how to act with integrity, fairness, and in an ethical and legal manner (p. 7).

Domain II – Instructional Leadership

Competency 004

The principal knows how to facilitate the design and implementation of curricula and strategic plans that enhance teaching learning; ensure alignment of the curriculum, instruction, resources, and assessment; and promote the use of varied assessments to measure student performance (p.8).

Competency 005

The principal knows how to advocate, nurture, and sustain an instructional program and a campus culture conducive to student learning and staff professional growth (p. 9).

Competency 006

The principal knows how to implement a staff evaluation and development system to improve the performance of all staff members, select and implement appropriate models of supervision and staff development, and apply the legal requirements for personnel management (p. 10).

Competency 007

The principal knows how to apply organizational, decision making, and problem solving skills to ensure effective learning environment (p. 10).

Domain III – Administrative Leadership

Competency 008

The principal knows how to apply principles of effective leadership and management in relation to campus budgeting, personnel, resource utilization, financial management, and technology (p. 11).

Competency 009

The principal knows how to apply principles of leadership and management to campus physical plant and support systems to ensure a safe and effective learning environment (p. 11).

Standard Principal ExCET Development

The Standard Principal ExCET was developed by soliciting input from a cross section of K-12 educators, faculty from educator preparation programs, education service center personnel, professional organizations, content experts, business community and parents. The ExCET development process included the following phases:

1. Developing standards for what beginning principals should know;
2. Reviewing standards through public comment period;
3. Developing the framework, which included the specific competencies;
4. Conducting a content validation survey to determine the relative job importance of each competency;
5. Developing and reviewing test item by the test developer;
6. Conducting a pilot test of the new items;
7. Reviewing the pilot test data and conducting preliminary standards setting;
8. Administering the new ExCET Principal test;
9. Setting the passing standards (State Board for Educator Certification, 2000).

Graduate Record Examination (GRE)

Historically, one of the criteria used for screening and admitting a student to a graduate school is the use of the Graduate Record Examination (GRE) developed by the Educational Testing Service (2001a). This premise suggests a relationship between

a particular score attained on the GRE and the likelihood of future success in graduate level courses.

The Graduate Record Examination's General Test measures an individual's verbal, quantitative, and analytical skills that have been acquired over time and are not related to a specific field of study. The verbal component measures ability to analyze and evaluate material and synthesize information obtained from it. The quantitative measures basic mathematical skills and the understanding of elementary mathematical concepts. The analytical test measures an ability to understand, deduce, analyze and evaluate information by identifying hypotheses, drawing conclusions, and developing plausible causal explanations (Educational Testing Service, 2001a).

Each subtest yields a score between the range of 200 – 800. Scores from the different subtests should be considered independent of one another because each measure is scaled separately. For instance, based on all examinees who took the test between October 1, 1996 and September 30, 1999 a score of 600 on each of the subtests would place the individual at the 85 percentile in verbal, 55 percentile in quantitative and 61 percentile in analytical. During the same period, the mean scores of all test takers were 471 verbal, 569 quantitative and 547 analytical. Whereas, the mean scores for examinees who reported education as their major were 447 verbal, 511 quantitative and 534 analytical (Educational Testing Service, 2001b).

Considerations in Score Interpretation

According to the Educational Testing Service (2001a), the Graduate Records Examination scores provide a common measure for comparing the abilities of students who come from a variety of colleges and universities with different standards and methods for measuring success in their program. However, it should be noted that the Educational Testing Service does not advocate using the GRE in isolation but as a supplement to other information such as undergraduate record, letters of recommendation, interviews, or other information used in the admissions process.

Educational Testing Service (2001b) conducted a study during the 1993-1994 testing year (N = 417K) to determine the effect on different subgroups when a combined verbal and quantitative score of 1000 was used for admission to graduate school. For instance 86 percent of African American, 69 percent Mexican American, 61 percent of Hispanics, whereas, only 45 percent of whites and 38 percent of Asian Americans fall below the combined verbal and quantitative score of 1000. With regard to gender, 55 percent of females scored below the cut off as opposed to 35 percent of males. The conclusion of the study was that the use of adhering to a particular cut off score can systematically discount large numbers of students from various subgroups. Interestingly, Davidson and Lewis (2000) studied the predictive validity of GRE, IQ and general academic aptitude but failed to establish any correlation between GRE and criterion-referenced examinations.

Design

The design for this study was correlational research. Students enrolled in a Standard Principal certification program at two regional universities served as the source of data. The study involved collection of two test scores from each participant in an effort to analyze any potential correlation and/or predictive value of one to the other.

Research Questions

Most accredited universities and graduate programs require some form of standardized test, such as the Graduate Records Examination (GRE), as a criteria for program admission. The two universities involved in this study use the Verbal and Quantitative scores on the GRE as part of their respective admission criteria. Given this fact, the research in this study was guided by the following questions:

1. Is there a correlation between the Graduate Records Examination score and the Standard Principal Examination for Certification of Educators in Texas score of students enrolled in a university administrator preparation program?
2. Does the Combined Verbal/Quantitative Graduate Records Examination scores of students enrolled in a university administrator preparation program provide any predictive value for performance on the Standard Principal Examination for Certification of Educators in Texas?

A correlation, as reflected in the answer to the first research question, determined the applicability of the second research question. Absent an identified correlation between the two sets of scores, the predictability of such scores would be obviously negative.

Instrumentation

The scores from two instruments were used in this study. First, scores from the verbal and quantitative portions of the Graduate Records Examination were combined (referred to as Combined Verbal/Quantitative GRE Score) to make one score for each student in the study. Possible scores on each portion of the Graduate Records Examination range from 200 to 800 (Educational Testing Service, 2001a). The maximum score that could be earned on the combination of verbal and quantitative was 1600.

Additionally, the total score earned by each student on the Examination for the Certification of Teachers (ExCET) Number 68, Standard Principal, was also used. The Standard Principal ExCET was revised by the State of Texas for use beginning with the Fall of 2000 test administration date (State Board for Educator Certification, 2000). This revision included a change in content as well as a change in the methodology and scale used to score the instrument. While domain scores are calculated on ExCET Number 68, only the total scale score was used in this study. The possible scores on this instrument range from 100 to 300.

Sample

The sample for this study consisted of students enrolled in one of two regional university administrator preparation program. The group from one university (University A) was composed of all students taking the Standard Principal ExCET during the first Spring 2001 test administration date. The group from the other university (University B) in the study was composed of all students taking the Standard Principal ExCET during the second Spring 2001 test administration date.

The 30 students from the University A were added to the 23 students from University B which collectively created the sample for this study with 53 students. Of the 53 students making up the sample, 54.7 percent ($n = 29$) were female and 45.3 percent ($n = 24$) were male.

Ethnically, the study sample divided in to three groups. White students, with 73.6 percent ($n = 39$) of the sample, made of the largest ethnic group. African-American students accounted for 17.0 percent ($n = 9$) for the study sample followed by Hispanic students at 9.4 percent ($n = 5$).

Results

The first research question was answered using the Pearson Product-Moment Coefficient (r) statistical treatment with a minimum r score of 0.65 required to indicate a correlation (Fraenkel & Wallen, 2000) between scores. Statistical significance for the correlation was established by the researchers at the 0.01 level.

The second research question was answered using a scatterplot and simple prediction equation. The prediction equation was calculated after applying a regression line to the scatterplot and expressing the line as an equation.

Combined Verbal/Quantitative GRE Scores for the students enrolled at University A showed a low score of 510 and a high score of 1080. University A score analysis documents a mean of 796.33 for the Combined Verbal/Quantitative GRE Scores with a standard deviation of 161.79. University B Combined Verbal/Quantitative GRE scores showed a range with a minimum score of 580 and a maximum score of 1170. The mean for University B scores was 854.78 with a standard deviation of 143.68.

Standard Principal ExCET scores between the two University groups was somewhat similar. University A produced an ExCET score range of a minimum of 195 and a maximum of 284. The mean for the University A ExCET scores was 249.70 with a standard deviation of 20.80. University B ExCET scores produced a minimum score of 217 and a maximum score of 279. The mean of the University B scores was 253.22 with a standard deviation of 14.43. The remaining data and statistical findings for this study are presented as they apply to each of the two research questions.

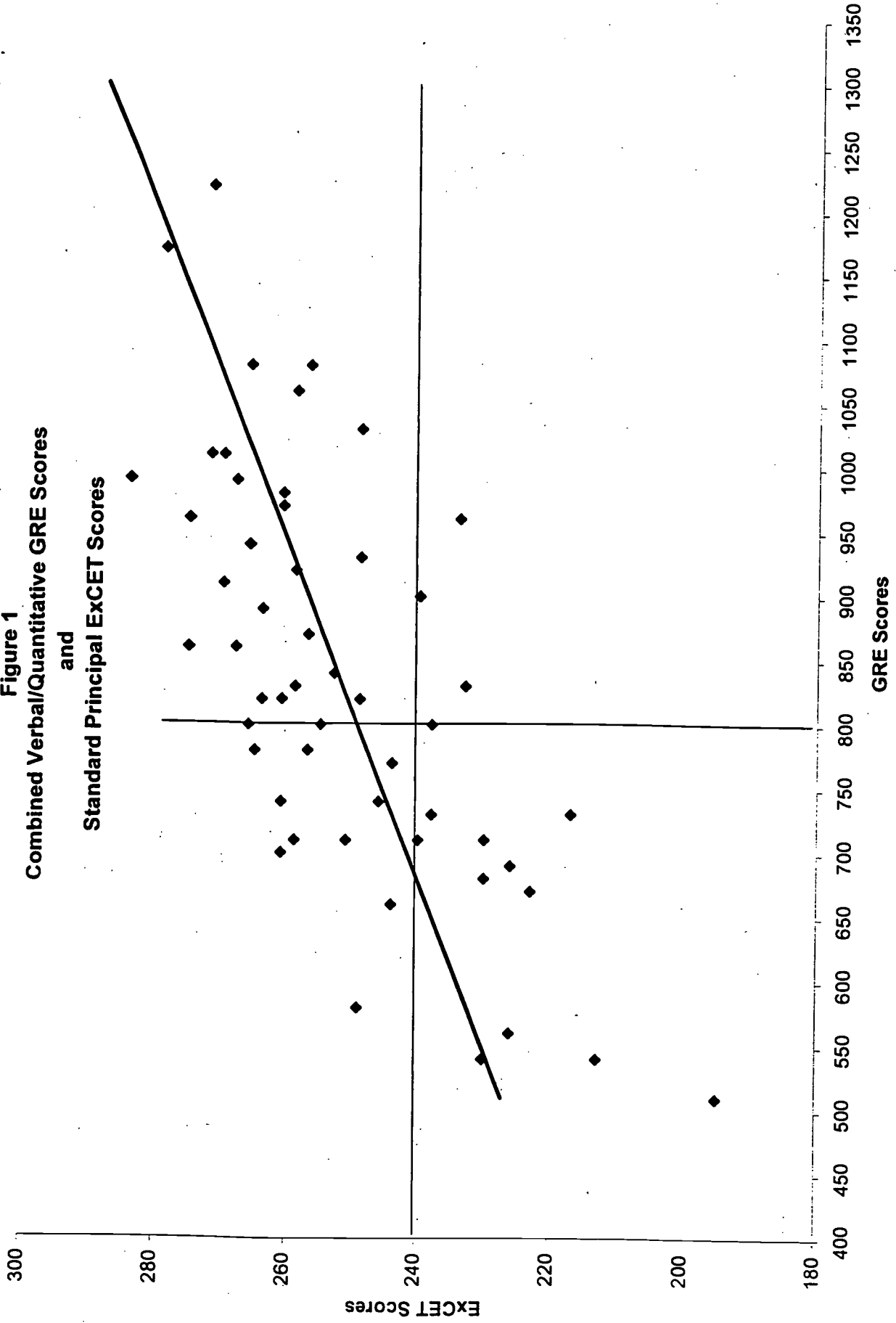
Research Question One. Statistical analysis of the sample data of Combined Verbal/Quantitative GRE Scores and Standard Principal ExCET scores provide Pearson Product-Moment Coefficient (r) scores of 0.686, thus indicating the existence of a correlation between the GRE and ExCET scores. Statistical significance of this correlation was determined to be at the 0.01 level.

Research Question Two. With a confirmed correlation established between both sets of scores, further treatment was applied in order to assess the predictive value of the GRE score for performance on the ExCET. Upon plotting the scores on a scatterplot (see Figure 1), a line has been statistically charted to indicate the regression. The least squares regression line passes through the data according to the derived linear equation [$y = 0.0768x + 187.92$] whereas \hat{y} is the predicted ExCET score and \hat{x} represents the actual Combined Verbal/Quantitative GRE score. The standard error of slope was found to be 0.011289.

In order to test the null hypothesis that the true slope is zero, the ratio of the obtained slope to its standard error was calculated. This calculation yielded a t-test statistic of [$0.0768 / 0.011289 = 6.803$] showing statistical significance ($p < 0.00001$). Thus, the coefficient for the GRE is significantly different from zero, and this provides substantial evidence that scores on ExCET Number 68, Standard Principal, are significantly influenced by GRE skills. Additionally, the coefficient of determination (r^2) was calculated to be 0.4711. The coefficient of determination indicates that about 47percent of the variation in ExCET score performance is explained by performance in the Graduate Records Examination.

Finally, the standard error of estimate, to indicate an index of prediction error, was determined to be 13.294. Given this value, an individual who obtains a mean combined GRE score of 1000 is predicted to score 265 on the Standard Principal ExCET. Moreover, 95 percent of the time, such a student will score between 238 and

Figure 1
Combined Verbal/Quantitative GRE Scores
and
Standard Principal ExCET Scores



291 on a similar test. Interestingly, this student has a 96.57 percent probability of obtaining a passing score (240) on the Standard Principal ExCET.

A student who scores only 800 on the Combined Verbal/Quantitative GRE is predicted to score 249 on this ExCET. In this scenario, the 95 percent confidence interval concludes a Standard Principal ExCET score between 223 and 276, and the student has a 75.82 percent probability of passing the examination. The aggregated data displayed on Figure 1 seem to suggest that the probabilities for passing the Standard Principal ExCET decrease substantially when a student scores below 800 on the Combined Verbal/Quantitative Graduate Records Examination.

Conclusion

The data clearly documents the significant relationship and correlation of the Graduate Records Examination (GRE) and the Standard Principal Examination for the Certification of Teachers in Texas (ExCET). With such a relationship and correlation established, regression line derived from the data offers an important and helpful equation in predicting a Standard Principal ExCET score from a GRE score. This validates the use of the GRE to meet the state requirement that a standardized test be used in admission and screening standards for certification candidates. This also may assist university faculty, involved in Standard Principalship graduate certification programs, in the screening and admission process.

While the sample did include students from two different Texas public institutions of higher education, the total number of students in the study (n=53) could

be expanded. Replication of this study incorporating data from additional Texas Universities would be useful and thus an implication for further study. Also, as the new Standard Principalship ExCET continues to be administered, additional data at the two Universities represented in the study and others will become more abundant thus offering additional opportunity for study.

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